

### **Amendments to the Claims**

This listing of claims will replace the originally filed claims in the application.

#### **Listing of Claims:**

Claims 1 – 16 (cancelled)

Claim 17 (new): A method which may be used to separate propylene from propane from within a gas mixture, said method comprising:

- a) contacting a gas mixture with a first membrane, wherein said gas mixture comprises propylene and propane;
- b) obtaining a both propylene-enriched permeate and a propane-enriched retentate through the selective permeation, by said first membrane, of propylene with respect to propane; and
- c) decreasing the propylene concentration of said permeate in said first membrane with a first sweeping gas.

Claim 18 (new): The method of claim 17, wherein said membrane comprises at least one material selected from the group consisting of:

- a) polyimides;
- b) polyphenylene oxides; and
- c) polymers.

Claim 19 (new): The method of claim 17, wherein:

- a) said method is performed during a polymerization of polypropylene; and
- b) said first sweeping gas comprises ethylene.

Claim 20 (new): The method of claim 17, further comprising pretreating said gas mixture prior to said selective permeation, wherein:

- a) said gas mixture further comprises hydrogen; and
- b) said pretreating comprises:
  - 1) contacting said gas mixture with a second membrane; and
  - 2) obtaining a permeate enriched with hydrogen and a retentate enriched with propylene and propane, by a selective permeation with said second membrane.

**Claim 21 (new):** The method of claim 20, wherein said second membrane comprises at least one material selected from the group consisting of polyamides and polyimides.

**Claim 22 (new):** The method of claim 20, further comprising decreasing the hydrogen concentration of said permeate enriched with hydrogen in said second membrane with a second sweeping gas.

**Claim 23 (new):** The method of claim 22, wherein said second sweeping gas comprises nitrogen.

**Claim 24 (new):** A method which may be used for the polymerization of polypropylene, said method comprising:

- a) performing a polymerization of propylene;
- b) recovering an effluent from said polymerization, wherein said effluent comprises:
  - 1) polypropylene;
  - 2) propane; and
  - 3) propylene;
- c) treating said effluent to produce a solid effluent and a gaseous effluent, wherein:
  - 1) said solid effluent comprises polypropylene; and
  - 2) said gaseous effluent comprises propane and propylene;
- d) treating at least part of said gaseous effluent to separate said propylene from said propane, wherein said treating said gaseous effluent comprises:
  - 1) contacting at least part of said gaseous effluent with a first membrane;
  - 2) obtaining both a propylene-enriched permeate and a propane-enriched retentate, through a selective permeation of propylene with respect to propane, wherein said permeation is carried out by said first membrane; and
  - 3) introducing a first sweeping gas to decrease the propylene concentration of said permeate in said first membrane; and
- e) introducing said propylene-enriched permeate to said polymerization of propylene.

**Claim 25 (new):** The method of claim 24, wherein said first membrane comprises at least one material selected from the group consisting of:

- a) polyimides;
- b) polyphenylene oxides; and
- c) perfluoropolymers.

**Claim 26 (new):** The method of claim 24, further comprising pretreating said gaseous effluent prior to said selective permeation, wherein:

- a) said gaseous effluent further comprises hydrogen; and
- b) said pretreating comprises:
  - 1) contacting said gaseous effluent with a second membrane; and
  - 2) obtaining a hydrogen enriched permeate and a retentate enriched with propylene and propane, by a selective permeation with said second membrane.

**Claim 27 (new):** The method of claim 26, wherein said second membrane comprises at least one material selected from the group consisting of polyamides and polyimides.

**Claim 28 (new):** The method of claim 26, further comprising decreasing the hydrogen concentration of said hydrogen enriched permeate in said second membrane with a second sweeping gas.

**Claim 29 (new):** The method of claim 28, wherein said second sweeping gas comprises nitrogen.

**Claim 30 (new):** The method of claim 24, wherein said polymerization of polypropylene comprises a copolymerization of polypropylene.

**Claim 31 (new):** The method of claim 30, wherein said first sweeping gas comprises ethylene.

**Claim 32 (new):** The method of claim 24, further comprising mixing said effluent with a second gaseous effluent, wherein said second gaseous effluent is produced by:

- a) performing a copolymerization of polypropylene followed by a recovery of a second effluent, wherein said second effluent comprises polypropylene, propane, and propylene; and

- b) treating said second effluent to produce a second solid effluent and said second gaseous effluent, wherein:
  - 1) said second solid effluent comprises polypropylene; and
  - 2) said second gaseous effluent comprises propane and propylene.